

Victorian 6502 User Group Newsletter

KAOS

For People Who Have Got Smart

HARDWARE: DAVID ANEAR
SOFTWARE: JEFF RAE
LANGUAGES: TONY DURRANT
AMATEUR RADIO: ROD DRYSDALE VK3BYU
EDUCATION: NOEL DOLLMAN
LIBRARY: JANNENE
TAPE LIBRARY: RON CORK
NEWSLETTER: IAN EYLES
SYM: BRIAN CAMPBELL
ATARI: GERRY MCCAUGHEY
SECRETARY: ROSEMARY EYLES

OSI	SYM	KIM	AIM	ATARI	APPLE	UK101	ORANGE
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Vol.2 No.6

March 1982

In answer to those people who have enquired, the wrappers for the newsletter are printed on a Microline 80. Membership records are stored on a disk using Pico Dos, the reason we use Pico Dos is that the program was originally written for a cassette system and can still be used as such if I have trouble with my disk. Membership details are stored as Data statements in six files with about sixty members on each file. The numbers on the back of the wrapper represent the position in the file, the member's number and the mail exchange (for bulk postage sorting). eg. 302 is Footscray mail exchange which handles all mail for the western suburbs of Melbourne.

You will notice that there are more adds offering second hand Super-boards for sale. This is usually because they are buying a Peach or Orange machine. We feel there must enough Peach and Orange users around now to form their own interest group. If you own an Orange or a Peach and are interested in the idea, get in touch with us and we'll put you in touch with other interested members.

The prototype and art work of David Tasker's new video board has arrived in Melbourne and is at present being costed. If all goes well we will be able to give you details of cost and availability at the next meeting.

We are still looking for original ideas for programs, we have plenty of people who can write programs but they need ideas to work on. So if you have an idea or a partly written program, send it in and we will see what we can do with it.

We are presently negotiating a deal to buy Electro-Med acoustic couplers for approximately \$240.00 ea. inc. tax. To get them at this price we must buy at least fifty and pay C.O.D.. If you are interested, please contact us. Do not send money now, if there is enough demand, we will contact you regarding payment.

The next meeting will be held on Sunday 28th March at 2pm at the Essendon Primary School, corner of Raleigh St and Nicholson St, Essendon. Would the usual early arrivers please note that the children from the school will be in early for their lesson.

DISK FILES

If you have ever tried to use the OS65D Disk File Handling, a number of problems would have become evident.

Firstly, the method of creating Disk Buffers, by running the BASIC Utility "CHANGE" is extremely tedious and, thankfully, this procedure has been obviated by the "BS" and "BR" commands of COMP-DOS 1.2.

Sequential files are the most efficient way to store data on disk but they are very hard to manage. Random files on the other hand are very easy to manipulate and extend but use a lot of disk space, each record being 128 bytes even if only one byte is used. Very wasteful. So I decided to find a way to modify the Random files software to alter the record size.

After much study of listings and a lot of experimentation, I found two key locations.

These are:- \$2F0A = No. of records per track
 \$2F2C = Length of a record

The number of records per track is quite straight forward, simply place the number directly into the location. The record length is more complex as it can only be altered in powers of 2. The exponent of 2 that gives the record length in bytes is used in this case.

The table below shows the value to poke for all possible combinations for 5½" and 8" disk systems.

Required RCD Length	RCD Length Poke 12076 (\$2F2C)	RCD/Track Poke 12042 (\$2F0A)	
		5½"	8"
2	1		
4	2		
8	3	255	
16	4	128	192
32	5	64	96
64	6	32	48
128*	7*	16*	24*
256	8	8	12

The asterisk shows the standard values.

One important note is that you must POKE these locations each time after opening a file as the get/put overlays are recalled from Disk on the "OPEN" command.

Steve Stokes

***** FOR SALE *****

Superboard II in an aluminium case
with mains filtered 5 amp supply,
8k ram, Dabug III, 48 character
screen mod, 10 cassettes of software.
All manuals and circuits.

New 12" B & W TV monitor.
* \$90. *

* \$475. * CNC

Ring Roger Godfrey, anytime

SYM-POSIUM

SUPERMON - THE SUBROUTINES

SUPERMON is a highly structured little program. At the highest level is the main loop with only three instructions; all JSRs. The first gets a command, the second analyses and executes it and the third prints an error message if required. The result of this structure is a host of useful subroutines which can be used by the programmer. Even SUPERMON itself can be called as a subroutine.

One very important subroutine is called ACCESS. This routine removes the write protection from the system RAM. Many other subroutines may use this RAM and as soon as your program either tries to write to the system RAM or execute one of these subroutines, the program will fail.

If you wish to use SUPERMON itself as a subroutine, execute a JSR \$8035 instruction. An address with a ',3' after it will be printed. If you are writing a program in BASIC, use :

```
(line number) X = USR("&"8035",0)
```

and the same thing will result. As long as you have not used a 'G' command or changed the program counter with an 'R' command in SUPERMON, then a simple 'G (CR)' will resume execution in your program where it left off.

Those of you who are still using the hex keypad will be especially interested in subroutine DELAY. This routine will continue to scan the seven segment display during the delay. Even if you have a terminal, this routine is extremely useful. To use it, all you need to do is store a value in location \$A656 (try \$0A at first) and call DELAY at \$835A. It is important to note that there is an error in the manual. It says that DELAY only affects the flags, but it also alters the X register.

The manual lists many other useful subroutines and it is well worth while studying these and writing experimental programs to see how they work. Here are a few not mentioned in the manual:-

STOCOM	\$8120	Output a CRLF, your own prompt, call INCHR then JSR STOCOM. This routine is similar to GETCOM but gives you the freedom of your own prompt, any number of characters in your command and your own hashing system. It will still allow up to three parameters and will store them away in the usual way.
OUTSZ	\$8319	Outputs the contents of \$FE and \$FF. Alters F, A and X.
OUTQM	\$8320	Outputs a '?'. Alters F and A.
SPC2	\$833F	Outputs two spaces. Alters F.
SPACE	\$8342	Outputs a space. Alters F.
RDBYTH	V1.0 \$8DE2 V1.1 \$8DE5	Read a byte from cassette tape (high speed).
OUTBTH	V1.0 \$8F17 V1.1 \$8FOE	Write a byte to cassette tape (high speed).
SYNC	V1.0 \$8D82 V1.1 \$8D52	Get in sync with the incoming data from cassette.

The three cassette routines can be a little tricky to use, therefore I will leave further discussion of these routines for a future article. As you have probably guessed, it is possible to write your own cassette format.

Before finishing this article, it is important to mention a bug in BASIC and a simple cure.

The multi-parameter USR statement is unique to the SYM and is a very powerful tool for calling up machine code subroutines and the passing parameters to and fro. Unfortunately, the 'fro' bit does not work properly. If what the manual said was correct, then the statement:-

```
X=INT(USR("&"8A1B",0)/256)
```

would return the ASCII code of a key pressed on the keyboard. If you try this statement you will get garbage. If you write your own machine code subroutine to be called by BASIC, end it with a JMP \$D14C if a parameter is to be returned. If you must use a subroutine ending in RTS then you must fool BASIC into jumping to \$D14C. The easiest way to do this is to add -11957 as the second last parameter. This means that the above example should be:-

```
X=INT(USR("&"8A1B",-11957,0)/256)
```

Those of you who understand how the USR function works will realise that this merely pushes a false return address on the stack.

There is far more in the subroutine library which I have not been able to cover so have a good look through the monitor listing and you will be surprised with what you will come up with.

NEXT MONTH - SUPERMON COMMAND HANDLING

Before we can look at writing your own commands, we must first see how SUPERMON handles them. This article will go step by step through an example of command execution; from fetching the command to the final execution and 'cleaning up'.

Most of you have probably heard of the SYM Users Group (SUG) in the U.S.A. and the magazine "SYM-PHYSIS". The editor of this magazine is Prof. "LUX" Luxenberg who will be visiting Melbourne at the end of next month and we are considering inviting him to the April KAOS meeting. If you are interested in meeting him then ring Andrew Stephanou on 383 3235 and let him know. It would be embarrassing to invite him to the meeting and have nobody there.

At the moment the SYM group has thirteen members and is growing by about one per fortnight, so it is time to find out where we are going. You should have received a questionnaire with this newsletter. Please complete this form and send it to me C/O 10 Forbes St., Essendon, Vic. 3040.

Until next time,
Brian Campbell

REAL TIME CLOCK 2ND. MODIFICATION

After trying the real time clock (issue 1, Vol. 10), and modification (issue 1, Vol. 11) the time display is still overwritten on a full screen. A simple solution to the problem is a change on line 30.

Change the screen size to - 1.

The time display will then sit below the Cursor line.

Happy Computing,
Robert Brettarecker

Dear Ian and Co.,

For the past two months I have been attending a course on visual systems for flight simulators in the Dallas/Fort Worth area. I have managed to find time to explore the computer shops in the area and to look for some electronic bits and pieces which I wanted.

The area is totally dominated by Tandy as their head office is down the road from me at Fort Worth. Arlington, where I am working is between Dallas and Fort Worth and has a population of about 60,000. There is no problem obtaining a Tandy machine as there are six or seven large Tandy stores and two Tandy Computer Centres here.

There are very few other Computer dealers that we could find and of those, they mainly sell APPLE or ATARI machines. OSI is dead in this part of the world, most dealers having dropped OSI due to the poor delivery and support. There is also no software for these machines, however their business machines have a good reputation as far as hardware is concerned.

Most of the software we have looked at is poor on quality but big on price. The local micro users don't write their own software and almost no-one does their own hardware.

The cost of h/ware add on bits for a Tandy machine is astronomical for what you get. ie. the cable and adaptor for a colour computer (Tandy 6809) to Epsom printer costs \$45.00 at a discount store, it consists of a 69¢ connector, piece of 4 core cable and a pc board with two transistors worth 20¢ each on it.

There are no electronic parts suppliers as we know them. If you want a memory chip you have to do it via the mail which could take a month!

This weekend I was taken to a side-walk sale by some of the amateur radio operators. The side-walk sale is like a flea market but only dealing with HAM gear and computer bits. The attendance was poor this weekend as it was bitterly cold, however if you were after old bits and pieces it was very good. ie. TV cameras in working order \$60.00, T1 Computers 9900 with monitors and 32K RAM \$350.00, H.P. 608 signal generator in working order \$200.00 just to name a few. Infact you could have equipped a complete HAM shack for under \$1000.00 including CROs etc.. I obtained a 16 key pad in new condition for \$6.00. There were very few components available and no-one knew where to obtain a micro chip except via mail order.

In conclusion, there is very little doing in the micro field as far as the hobbist is concerned and all the small computer businesses like COMP-SOFT, LOOKY VIDEO etc. are being bought out or going bust. Australia is a far better place to be if you want to play with computers or H/ware.

D.J. Anear

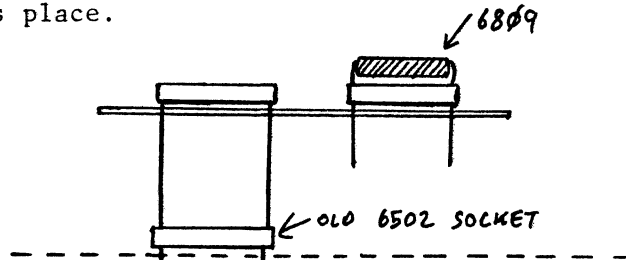
FOR SALE

PRINTERS (no keyboard) 50 BAUD BAUDOT (Teletype brand) C/W transformer will connect to RS232 with REED relay and interface - \$40.00
Made up with option couple interface and wooden box - price by negotiation

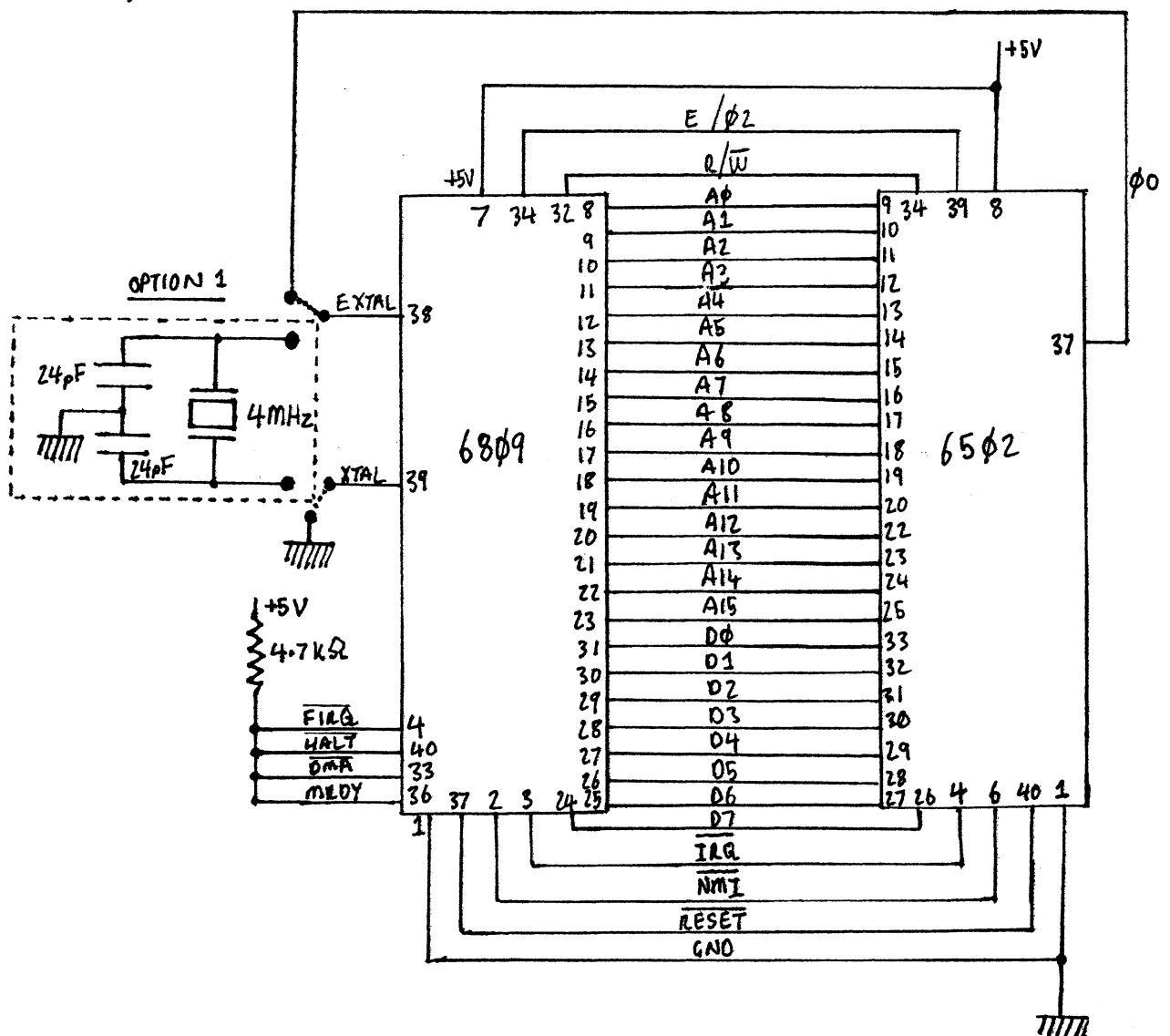
Clive Harman

6502/6809 UPGRADE

This article describes how to upgrade a 6502 based system to a 6809 one. As you can see from the circuit diagram, the connection is very straight forward and requires no extra logic. I simply used two 40 pin wire wrap sockets and wire wrapped the socket pins together as shown in the circuit. I then cut the legs off the 6809 socket, removed the 6502 and inserted the other socket in its place.



The 6809 requires a clock of 4 times its bus frequency, therefore if you intend to run it at 1MHz, the clock input has to be 4MHz. Most 6502 systems have a clock input of 1MHz or 2MHz. Therefore the clock input to pin 37 of your 6502 has to be increased by 2 or 4 times. If you intend to make the board easily removable, you must use a separate 4MHz crystal as shown in option 1 on the circuit diagram. This allows you to make this sub-board easily removable without requiring any modifications to your current system.



Now for the hard part, the software. I will leave you to explore that.

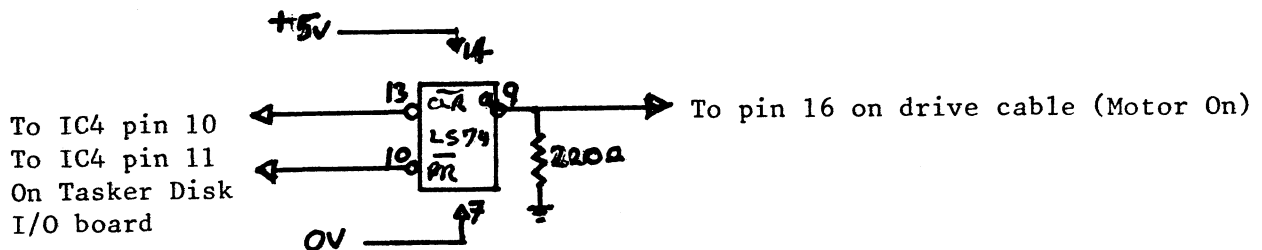
I wrote a simple routine to clear the screen and flash some messages on the screen, which I burned into an EPROM. This at least showed me the idea works.

If there is enough interest shown at the next meeting, we will set up a group to dicuss writing software for the 6809.

George

DISK DRIVE SWITCH

This is an easy method of switching your disk drive on or off under software control. You'll need one 74LS74 and one 220R resistor (and some ribbon cable).



You'll need to change the links on the IC header on the top right hand corner of the MPI 51 drive, link pin 2 to pin 13 (for drive 0) and link pin 7 to pin 8, this will unload the head when the drive is off.

To use the switch you will have to know two addresses:

To switch the drive on POKE 49160,(anything)
To switch the drive off POKE 49156,(anything)

If you're running a Tasker PIA/VIA board then these addresses will conflict, and you will have to find two other spare address select lines.

NOTE You'll have to give the drive a chance to reach full speed before accessing it FORX=1TO50:NEXT will probably do so use:-
xxx POKE 49160,0:FORX=1TO50:NEXT

If you have any problems please contact me on

Paul Dodd

FOR SALE

SUPERBOARD (Series 1) in case with Ohio 610 expansion board, power supply and fan.
32K RAM, dual floppy disk interface, RS232 printer port, documentation and software (mostly games)

\$600

Russell Cooper

(MIS)ADVENTURES IN I/O

It is very easy to just forget about the problems you have had now that they are solved and to press on in your work. However, I have decided that if I use a little more time to write this note possibly I will be able to save someone else more time than I would loose. I'm an amateur in digital electronics, so if you don't think I'm correct in what I say don't sit there, write me a note.

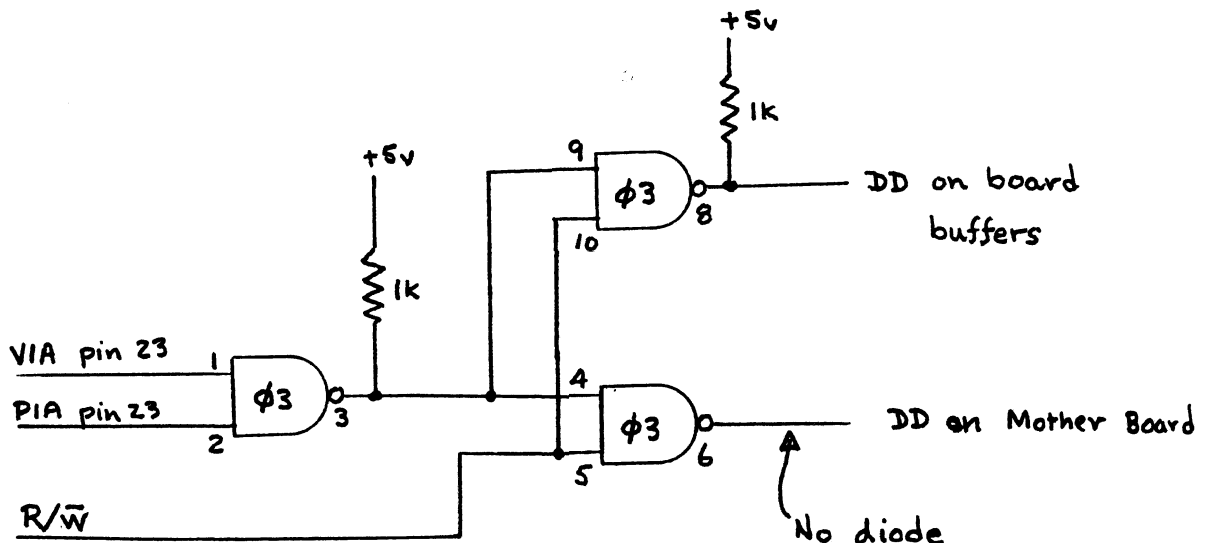
To start with I wanted to control things (diabolical plan: tomorrow the world), so I decided I needed a real-time (RT) clock and some I/O. The Tasker system seemed fine for these purposes and I opted for Geoff Cohen's RT clock. I next decided that I should be very careful with my I/O addresses and went to the KAOS Newsletter (Vol.1, No.6, p.2) with the idea of setting up my new devices in the "New Standard" (designed for the Tasker Buss, I might mention.).

Problem 1: Geoff Cohen's RT clock was set up for \$C030-\$C03F, and not the "New Standard" (\$C020-\$C02F).

Problem 2: Problem 1 didn't really matter because Tasker doesn't decode the VIA completely and it occupies 32 memory locations, \$C020-\$C03F (killing the "New RT clock Standard", designed for the Tasker Buss), while it needs only 16 locations. Solution: move the I/O board addresses to \$C040-\$C05F (still 32 locations).

Problem 3: Geoff Cohen's board is not completely decoded and like a herd of white ants was eating holes all through my memory map (COXX) and any possible I/O assignments with the Tasker I/O Board. Solution: use a 7427 chip (off-side) and completely decode Geoff's RT clock (conveniently this fell in the \$C020-\$C02F "New Standard" area, eureka!). Anyone interested in this mod let me know.

Problem 4: Tasker's I/O Board at \$C040-\$C05F still gives the RT clock the dirties. Saved by the KAOS Newsletter: George N. (and I should have) realised that Tasker's I/O Board has the data direction (DD) line decoded for all of \$C000-\$C800...i.e. all other devices are killed by one simple I/O board. George gave a solution to this problem in the Newsletter, but I feel this solution is dangerous. The diode to the DD line has normally a potential drop of 0.6-0.8 volts and TTL's usually pull to 0.4-0.8 volts. This means when the set up pulls low the DD line will be 1.0-1.6 volts. This is the official no-mans-land of TTL signals and should be avoided. I feel a better solution is to go back to an open collector chip (i.e. 7403 rather than the 7400) and keep the pull-up resistors. (However, don't use the optional 1k Ω pull-up resistor on Tasker's board which goes directly to the DD line.) The circuit become:



George's drawing of what to cut is the same except leave in the jumper and leave out the diode. Also do not remove the resistor as described; this is the resistor after pin 3 of the 7403. The resistor after pin 8 was never removed in George's note, so all these items are already on the board. (Also don't forget, not shown in George's drawing, to remove the jumper from the line from pin 6 of IC 7 (7432) to the new 7403.)

I would also suggest that the spare buffer on the Tasker Buss, the 7414 chip on the little connector board, be used to buffer the RESET line (line 27 to pin 11 on the 40 pin socket). Option?

All systems GO?

NO, Problem 5: I could not talk correctly to the VIA when using the timers. The A2 and A3 line are inverted if the board is wired according to directions given. The PIA is fine, however. Solution: the long jumper wires to the VIA should be switched for the A2 and A3 lines.

All systems GO!

Final Comment: Tasker does not decode lines A9 and A10 on the I/O board, so that the future expansion area of the "New Standard" (\$C050-\$C7FF) is shot full of holes. Be careful, you may fall into one of them (in the future)!!

Final plea: future boards.....complete decoding, please!!!!

Norm Hamer

SUPER SUPERBOARD EXPANSION BOARD

A 32K CMOS RAM expansion board with PIA, VIA, floppy disk controller is being developed for Superboard and ClP operators.

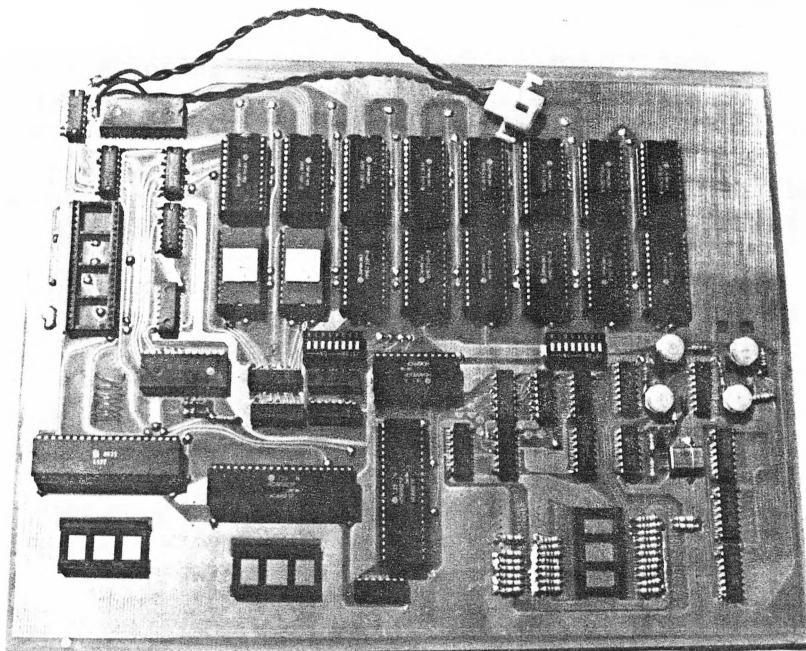
FEATURES OF THIS BOARD ARE:-

1. The board can be mounted inside OSI or KAOS cabinets.
2. The board plugs into the 40 pin expansion socket of the 600 board.
3. 150ns. memory access time (twice as fast as 2114's).
4. CMOS RAMs are pin for pin compatible with 2716 EPROMs.
This means that any combination of RAM or ROM can be used, provided page 0 is RAM.
5. Write protect selectable in 2K blocks by switching included on board.
6. Battery backup for expansion board. This board uses the latest low power Hitachi 6116L static RAMs which require 10uW. per chip in the standby mode and 180uW. in the operate mode. Thus a fully populated board will require less than 400uW. to drive the RAMs. More power will be required to operate the other board hardware, however, it is likely that if your power supply is not already overloaded then there will be no need to upgrade your power supply.

The battery backup of three penlight cells, will keep the memory going for about two years.

The fully assembled board is provided with a 6821 PIA, a 6522 VIA and a floppy disk controller all decoded for standard KAOS addressing.

Also included in the package is a 4MHz time base for real time clock applications. This clock is used with the floppy controller and there is also a six decade output from the 4MHz clock.



The prototype of this board has been completed at this stage, but has still to be tidied up before production can begin. The board will be double sided and will not have plated through holes unless sufficient orders make it a viable proposition. The cost of the boards has not yet been finalised, but it is expected that the cost of the fully assembled and tested board will be about \$350.00 and that the bare board will be about \$60.00. Both the complete and bare board will be supplied with full instructions for assembling and/or fitting to your 600 board.

Boards will only be produced against firm orders.

Enquiries can be made to:-

W Chilcott
VK3BVV

R Gardiner
VK3YNV

G Nikolaidis
COMP-SOFT

M.A.C.E.

Hello again,

At last we are getting a few members, so you can expect a few different articles (I hope). There is not a great deal happening this month, so I will give you a couple of programs and some interesting pokes to type in.

Enjoy your favourite cassette while you type that long program in. Insert the cassette into the 410* program recorder, press play, turn up volume on your T.V. set, then poke 54018,52. To turn it off poke 54018,60.

To get rid of that pesky cursor poke 752,1, to get it back, poke 752,0.

Can you read upside down? Poke 755,4. I can't either, poke 755,0.

Try the simple program listings.

```
5 RUN
10 REM THUNDER
15 FOR P=5TO100 STEP RND(0)*5+0.2
20 SOUND 0,P,8,(RND(0)*10+5)/(0.1*P)
25 SOUND 1,P+20,8,(RND(0)*10+5)/(0.1*P)
30 NEXT P
50 GOTO 10
```

```

100 REM A DROPPED COIN
105 P=60
110 FORJ=10TO0STEP-0.2
115 REM INCREASE VOLUME
120 FORV=1TOJ:SOUND0,P,10,V:NEXTV
122 REM DECREASE VOLUME
125 FORV=2*JTO1STEP-1:SOUND0,P,10,V:NEXTV
130 NEXTJ
150 END

```

NEWS: There is a new journal for the ATARI 400/800. A subscription (4 issues) will cost you \$12.00. It is called MICROPROBE and is written locally. Please mention M.A.C.E. when subscribing.

MICROPROBE
 3/41 Osborne Ave.
 Glen Iris
 Victoria 3146

Gerry

THE MEETING WAS KAOS

T.A.B.:— A record crowd attended the February meeting to witness a most interesting demonstration of the facilities offered by The Australian Beginning (previously advertised as The Australian Source). T.A.B. demonstrated how versatile their system is by retrieving a variety of data from their main frame computer via an acoustically coupled modem. One of the more interesting features was the ability to down load any program, written for OSI computers, within the program library. Many other services are available through T.A.B. too numerous to mention in this newsletter. For further information contact T.A.B. on 03 329 7998 or 329 7533 or write to T.A.B. 364 La Trobe St., Melbourne 3000.

ATARI:— For those people with expansion in mind, one would need to consider the new 128K RAM board distributed by Futuretronics. Gerry Mc Caughey displayed the RAM board which carries sixteen 64 X 1 RAM chips and fits on a board no longer than six inches by three inches. An approximate cost is around \$700.00U.S.

OSI EXPANSION:— One of our more dynamic members, Bill Chilcott VK3BVV, has produced an expansion board with a number of useful features which are listed below:—

32K of CMOS RAM	Floppy Disk Controller
PIA	VIA
Real Time Clock	Programmable Sound Generator
4 MHz on board clock	Double sided plated through board

I was amazed to learn that the whole board only draws six to seven hundred milli-amps during normal operation and with a slight modification one can achieve 40K of continuous RAM. Bill has indicated that the fully constructed and populated board will cost approximately \$350.00. Bare boards and partly constructed boards will be made available no prices have been decided yet.

After seeing the expansion board at the meeting, I believe that it is a far better alternative than the 610 board, which incidently is priced \$425.00 plus tax and it is only 8K of RAM expandable to 24K.

6809:— A small plug in board is all you require to convert your Superboard into a 6809 based computer and quite a deal of knowledge to rewrite the monitor ROM. George Nikolaidis displayed the board during the meeting, raising a number of interesting points to be considered.

73's Rod
 VK3BYU

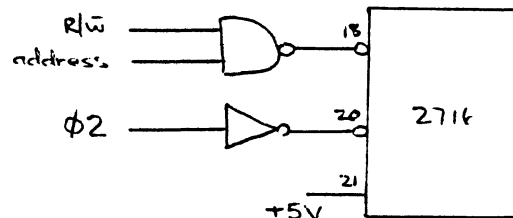
2716 2K X 8 EPROM AND THE PIN COMPATIBLE 2128 2K X 8 RAM

2716	Pin 18 CE	Pin 20 OE	Pin 21 Vpp	Outputs
Read	0	0	5V	data out
Low power stand by	1	don't care	5V	high imp
Desselect	don't care	1	5V	high imp.

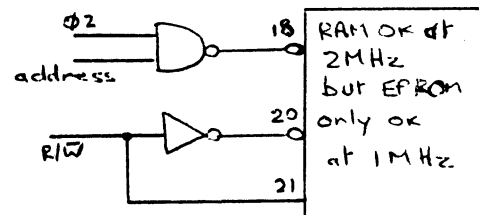
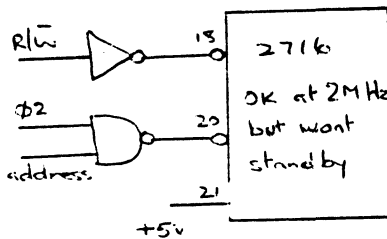
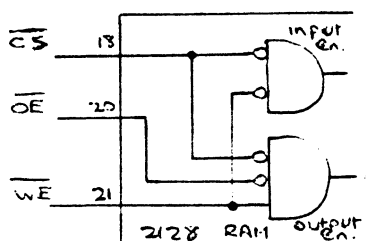
The 2716 has two chip select inputs, one is faster than the other.

Outputs are valid 450ns after pin 18 goes low
 " " " 120ns " " 20 " "

For a 2716 to work at 2MHz
 and stand by to 25% of normal
 power, it needs connecting as:-



This circuit is no good for a 2128 RAM as pin 21 is the R/W input.



John Whitehead

FOR SALE

One as new SYM micro computer board. Memory 4K Supermon and 4K RAM.
 All documentation included \$150.00

Ring Peter French on

FOR OSI USERS

Have you ever tried to use LIST in the middle of a program. If you have you will know the program halts immediately after performing the LIST command. This problem can be overcome by:-

100 POKE 4,194:POKE 5,165:LIST:PRINT:POKE 4,195:POKE 5,168

This changes the message printer jump to the execute next BASIC statement routine, therefore returning control to the program not the keyboard.

Reprinted from TUGO No.6

Because of lack of space the M/C article and corrections to Jeff Rae's article on modifying the C1/C4 board, have been held over to the next issue.

If you paid your membership for T.A.B. through KAOS and have not yet received any documentation please contact us and we will chase it up for you.